

**Claims:**

1           1.    A method for operating a receiver to receive data  
2    from a transmitter across a wireless link, the method  
3    comprising:

4           receiving, by a physical layer operating on the  
5    receiver, a physical layer frame from the transmitter across  
6    the wireless link, wherein receiving the physical layer frame  
7    includes:

8                determining whether the physical layer frame is  
9           error free;

10               when the physical layer frame is error free,  
11           acknowledging to the transmitter a successful receipt,  
12           extracting a packet data unit from the physical layer  
13           frame, and passing the packet data unit to a link layer  
14           operating on the receiver; and

15               when the physical layer frame is not error free,  
16           negatively acknowledging to the transmitter a successful  
17           receipt; and

18           receiving, by the link layer operating on the receiver,  
19    a packet data unit, wherein receiving the packet data unit  
20    includes:

21               determining whether a packet data unit is lost; and

22               when the packet data unit is lost, delaying an  
23           automatic retransmission request for a lost packet data  
24           unit for a delay period corresponding to an error

25 recovery operation at the physical layer for the lost  
26 packet data unit.

1 2. The method of claim 1, wherein the delay period  
2 corresponds to N attempts to successfully receive a physical  
3 layer frame containing the lost packet data unit, and wherein  
4 N is an integer.

1 3. The method of claim 1, wherein:  
2 the transmitter is a base station; and  
3 the receiver is a mobile station.

1 4. The method of claim 1, wherein:  
2 the transmitter is a mobile station; and  
3 the receiver is a base station.

1 5. The method of claim 1, wherein determining whether  
2 a packet data unit is lost includes comparing the sequence  
3 number of a received packet data unit to the sequence number  
4 of an expected packet data unit.

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1           6.    A method for operating a transmitter to transmit  
2 data to a receiver across a wireless link, the method  
3 comprising:

4           passing a packet data unit from a link layer operating  
5 on the transmitter to a physical layer operating on the  
6 transmitter;

7           packaging the packet data unit into a physical layer  
8 frame;

9           transmitting the physical layer frame to a receiver  
10 across the wireless link;

11           awaiting an indication of successful receipt of the  
12 physical layer frame from the receiver;

13           when an indication of a successful receipt of the  
14 physical layer frame is not received, initiating  
15 retransmission of the physical layer frame;

16           if the indication of successful receipt of the physical  
17 layer frame is not received after at least one retransmission  
18 attempt, notifying the link layer that the packet data unit  
19 is lost; and

20           the link layer initiating error recovery operations for  
21 the packet data unit that is lost.

1           7.    The method of claim 6, wherein N-1 retransmission  
2 attempts of the physical layer frame are attempted, and  
3 wherein N is an integer.

1        8.    The method of claim 6, wherein:  
2        the transmitter is a base station; and  
3        the receiver is a mobile station.

1        9.    The method of claim 6, wherein:  
2        the transmitter is a mobile station; and  
3        the receiver is a base station.

1        10.   The method of claim 6, wherein the link layer  
2        comprises a radio link protocol layer.

1        11.   A wireless receiver that operates to receive data  
2        from a wireless transmitter across a wireless link, the  
3        wireless receiver comprising:

4            an antenna;

5            a radio frequency unit coupled to the antenna; and

6            at least one digital processor coupled to the radio  
7        frequency unit that executes software instructions causing  
8        the wireless receiver to:

9            receive a physical layer frame from the wireless  
10        transmitter across the wireless link, wherein receiving the  
11        physical layer frame includes:

12            determining whether the physical layer frame is  
13        error free;

14            when the physical layer frame is error free,

acknowledging to the wireless transmitter a successful receipt, extracting a packet data unit from the physical layer frame, and passing the packet data unit to a link layer operating on the wireless receiver; and

when the physical layer frame is not error free, negatively acknowledging to the wireless transmitter a successful receipt; and

receive, by the link layer operating on the wireless receiver, a packet data unit, wherein receiving the packet data unit includes:

determining whether a packet data unit is lost; and

when the packet data unit is lost, delaying an automatic retransmission request for a lost packet data unit for a delay period corresponding to an error recovery operation at the physical layer for the lost packet data unit.

12. The wireless receiver of claim 11, wherein the delay period corresponds to N attempts to successfully receive a physical layer frame containing the lost packet data unit, and wherein N is an integer.

13. The wireless receiver of claim 11, wherein determining whether a packet data unit is lost includes comparing the sequence number of a received packet data unit

4 to the sequence number of an expected packet data unit.

1 14. The wireless receiver of claim 11, wherein the link  
2 layer comprises a radio link protocol layer.

1 15. The wireless receiver of claim 11, wherein:  
2 the wireless receiver is a mobile station; and  
3 the wireless transmitter is a base station.

1 16. The wireless receiver of claim 11, wherein:  
2 the wireless receiver is a base station; and  
3 the wireless transmitter is a mobile station.

1 17. A wireless transmitter that operates to transmit  
2 data to a wireless receiver across a wireless link, the  
3 wireless transmitter comprising:

4 an antenna;

5 a radio frequency unit coupled to the antenna; and

6 at least one digital processor coupled to the radio  
7 frequency unit that executes software instructions causing  
8 the wireless receiver to:

9 pass a packet data unit from a link layer operating  
10 thereon to a physical layer operating thereon;

11 package the packet data unit into a physical layer  
12 frame;

13 transmit the physical layer frame to the wireless  
14 receiver across the wireless link;

15 await an indication of successful receipt of the  
16 physical layer frame from the wireless receiver;

17 when an indication of a successful receipt of the  
18 physical layer frame is not received, initiate  
19 retransmission of the physical layer frame;

20 if the indication of successful receipt of the  
21 physical layer frame is not received after at least one  
22 retransmission attempt, notify the link layer that the  
23 packet data unit is lost; and

24 cause the link layer to initiate error recovery  
25 operations for the packet data unit that is lost.

1 18. The wireless transmitter of claim 17, wherein N-1  
2 retransmission attempts of the physical layer frame are  
3 attempted, and wherein N is an integer.

1 19. The wireless transmitter of claim 17, wherein the  
2 link layer comprises a radio link protocol layer.

1 20. The wireless transmitter of claim 17, wherein:  
2 the wireless transmitter is a base station; and  
3 the wireless receiver is a mobile station.

1           21. The wireless transmitter of claim 17, wherein:  
2           the wireless transmitter is a mobile station; and  
3           the wireless receiver is a base station.